

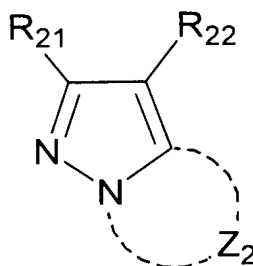
IN THE CLAIMS

Please amend the claims as follows:

Claims 1-2 (Canceled).

Claim 3 (Currently Amended): An organic thin film transistor comprising:
at least three terminals consisting of a gate electrode, a source electrode and a drain
electrode; and
an insulating layer and an organic semiconductor layer on a substrate, which controls
an electric current flowing between the source electrode and the drain electrode by applying
an electric voltage across the gate electrode, a distance between the source electrode and the
drain electrode being 1 μ m to 1mm;
wherein the organic semiconductor layer comprises a ~~The organic thin film transistor~~
~~according to Claim 1, wherein said heterocyclic compound containing a nitrogen atom is a~~
~~compound expressed by a following general formula (II):~~

(II)



wherein R₂₁ and R₂₂ each independently represents a hydrogen atom or a substituent;
and

Z₂ represents an atomic group forming a five-member ring or a six-member ring;
wherein the substituents represented by R₂₁ and R₂₂ are each independently selected
from the group consisting of an alkyl group having 1 to 40 carbon atoms, an alkenyl group
having 2 to 8 carbon atoms, an alkynyl group having 2 to 8 carbon atoms, an aryl group
having 6 to 40 carbon atoms, an amino group having 0 to 6 carbon atoms, an alkoxyl group
having 1 to 8 carbon atoms, an aryloxy group having 6 to 12 carbon atoms, an acyl group
having 1 to 12 carbon atoms, an alkoxycarbonyl group having 2 to 12 carbon atoms, an
aryloxycarbonyl group having 7 to 10 carbon atoms, an acyloxy group having 2 to 10 carbon
atoms, an acylamino group having 2 to 10 carbon atoms, an alkoxycarbonylamino group

having 2 to 12 carbon atoms, an aryloxycarbonyl-amino group having 7 to 12 carbon atoms, a sulfonylamino group having 1 to 12 carbon atoms, a sulfamoyl group having 0 to 12 carbon atoms, a carbamoyl group having 1 to 12 carbon atoms, an alkylthio group having 1 to 12 carbon atoms, an arylthio group having 6 to 20 carbon atoms, a sulphonyl group having 1 to 12 carbon atoms, a sulfinyl group having 1 to 12 carbon atoms, an ureide group having 1 to 12 carbon atoms, a phosphoric amide group having 1 to 12 carbon atoms, a hydroxy group, a mercapto group, a halogen atom, a cyano group, a sulfo group, a carboxyl group, a nitro group, a hydroxamic acid group, a surufino group, a hydrazino group, an imino group, and a heterocycle group having 1 to 12 carbon atoms; and

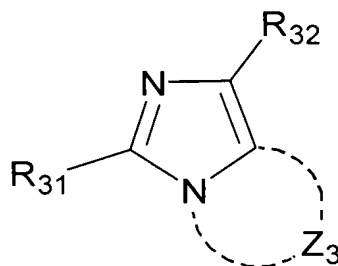
said substituents are each independently unsubstituted or further substituted with an alkyl group, an alkenyl group, an aralkyl group, an aryl group, an acyl group, an alkoxy group, an aryloxy group, an acyloxy group, an alkoxycarbonyl group, an aryloxycarbonyl group, a carbonylamino group, a sulfonyl amino group, a sulfamoyl group, a carbamoyl group, a cyano group, a halogen atom, a hydroxy group or a heterocyclic group.

Claim 4 (Currently Amended): An organic thin film transistor comprising:
at least three terminals consisting of a gate electrode, a source electrode and a drain
electrode; and

an insulating layer and an organic semiconductor layer on a substrate, which controls
an electric current flowing between the source electrode and the drain electrode by applying
an electric voltage across the gate electrode, a distance between the source electrode and the
drain electrode being 1 μ m to 1mm;

wherein the organic semiconductor layer comprises a ~~The organic thin film transistor~~
~~according to Claim 1, wherein said heterocyclic compound containing a nitrogen atom is a~~
~~compound expressed by a following general formula (III):~~

(III)



wherein R₃₁ and R₃₂ each independently represents a hydrogen atom or a substituent;
and

Z₃ represents an atomic group forming a five-member ring or a six-member ring;
wherein the substituents represented by R₃₁ and R₃₂ are each independently selected from the group consisting of an alkyl group having 1 to 40 carbon atoms, an alkenyl group having 2 to 8 carbon atoms, an alkynyl group having 2 to 8 carbon atoms, an aryl group having 6 to 40 carbon atoms, an amino group having 0 to 6 carbon atoms, an alkoxyl group having 1 to 8 carbon atoms, an aryloxy group having 6 to 12 carbon atoms, an acyl group having 1 to 12 carbon atoms, an alkoxycarbonyl group having 2 to 12 carbon atoms, an aryloxycarbonyl group having 7 to 10 carbon atoms, an acyloxy group having 2 to 10 carbon atoms, an acylamino group having 2 to 10 carbon atoms, an alkoxycarbonylamino group having 2 to 12 carbon atoms, an aryloxycarbonyl-amino group having 7 to 12 carbon atoms, a sulfonylamino group having 1 to 12 carbon atoms, a sulfamoyl group having 0 to 12 carbon atoms, a carbamoyl group having 1 to 12 carbon atoms, an alkylthio group having 1 to 12 carbon atoms, an arylthio group having 6 to 20 carbon atoms, a sulphonyl group having 1 to 12 carbon atoms, a sulfinyl group having 1 to 12 carbon atoms, an ureide group having 1 to 12 carbon atoms, a phosphoric amide group having 1 to 12 carbon atoms, a hydroxy group, a mercapto group, a halogen atom, a cyano group, a sulfo group, a carboxyl group, a nitro group, a hydroxamic acid group, a surufino group, a hydrazino group, an imino group, and a heterocycle group having 1 to 12 carbon atoms; and

said substituents are each independently unsubstituted or further substituted with an alkyl group, an alkenyl group, an aralkyl group, an aryl group, an acyl group, an alkoxyl group, an aryloxy group, an acyloxy group, an alkoxycarbonyl group, an aryloxycarbonyl group, a carbonylamino group, a sulfonyl amino group, a sulfamoyl group, a carbamoyl group, a cyano group, a halogen atom, a hydroxy group or a heterocyclic group.

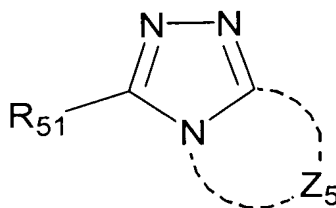
Claim 5 (Canceled).

Claim 6 (Currently Amended): An organic thin film transistor comprising:
at least three terminals consisting of a gate electrode, a source electrode and a drain
electrode; and

an insulating layer and an organic semiconductor layer on a substrate, which controls
an electric current flowing between the source electrode and the drain electrode by applying
an electric voltage across the gate electrode, a distance between the source electrode and the
drain electrode being 1 μ m to 1mm;

wherein the organic semiconductor layer comprises a ~~The organic thin film transistor~~
~~according to Claim 1, wherein said heterocyclic compound containing a nitrogen atom is a~~
~~compound expressed by a following general formula (V):~~

(V)



wherein R₅₁ represents a hydrogen atom or a substituent; and

Z₅ represents an atomic group forming a five-member ring or a six-member ring;

wherein the substituent represented by R₅₁ is selected from the group consisting of an
alkyl group having 1 to 40 carbon atoms, an alkenyl group having 2 to 8 carbon atoms, an
alkynyl group having 2 to 8 carbon atoms, an aryl group having 6 to 40 carbon atoms, an
amino group having 0 to 6 carbon atoms, an alkoxyl group having 1 to 8 carbon atoms, an

aryloxy group having 6 to 12 carbon atoms, an acyl group having 1 to 12 carbon atoms, an alkoxycarbonyl group having 2 to 12 carbon atoms, an aryloxycarbonyl group having 7 to 10 carbon atoms, an acyloxy group having 2 to 10 carbon atoms, an acylamino group having 2 to 10 carbon atoms, an alkoxycarbonylamino group having 2 to 12 carbon atoms, an aryloxycarbonyl-amino group having 7 to 12 carbon atoms, a sulfonylamino group having 1 to 12 carbon atoms, a sulfamoyl group having 0 to 12 carbon atoms, a carbamoyl group having 1 to 12 carbon atoms, an alkylthio group having 1 to 12 carbon atoms, an arylthio group having 6 to 20 carbon atoms, a sulphonyl group having 1 to 12 carbon atoms, a sulfinyl group having 1 to 12 carbon atoms, an ureide group having 1 to 12 carbon atoms, a phosphoric amide group having 1 to 12 carbon atoms, a hydroxy group, a mercapto group, a halogen atom, a cyano group, a sulfo group, a carboxyl group, a nitro group, a hydroxamic acid group, a surufino group, a hydrazino group, an imino group, and a heterocycle group having 1 to 12 carbon atoms; and

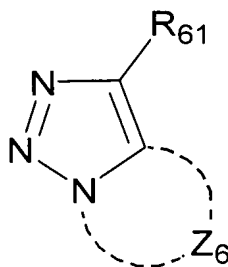
said substituent is unsubstituted or further substituted with an alkyl group, an alkenyl group, an aralkyl group, an aryl group, an acyl group, an alkoxyl group, an aryloxy group, an acyloxy group, an alkoxycarbonyl group, an aryloxycarbonyl group, a carbonylamino group, a sulfonyl amino group, a sulfamoyl group, a carbamoyl group, a cyano group, a halogen atom, a hydroxy group or a heterocyclic group.

Claim 7 (Currently Amended): An organic thin film transistor comprising:
at least three terminals consisting of a gate electrode, a source electrode and a drain electrode; and

an insulating layer and an organic semiconductor layer on a substrate, which controls an electric current flowing between the source electrode and the drain electrode by applying an electric voltage across the gate electrode, a distance between the source electrode and the drain electrode being 1 μ m to 1mm;

wherein the organic semiconductor layer comprises a ~~The organic thin film transistor according to Claim 1, wherein said heterocyclic compound containing a nitrogen atom is a compound expressed by a following general formula (VI):~~

(VI)



wherein R_{61} represents a hydrogen atom or a substituent; and

Z_6 represents an atomic group forming a five-member ring or a six-member ring;

wherein the substituent represented by R_{61} is selected from the group consisting of an alkyl group having 1 to 40 carbon atoms, an alkenyl group having 2 to 8 carbon atoms, an alkynyl group having 2 to 8 carbon atoms, an aryl group having 6 to 40 carbon atoms, an amino group having 0 to 6 carbon atoms, an alkoxyl group having 1 to 8 carbon atoms, an aryloxy group having 6 to 12 carbon atoms, an acyl group having 1 to 12 carbon atoms, an alkoxycarbonyl group having 2 to 12 carbon atoms, an aryloxycarbonyl group having 7 to 10 carbon atoms, an acyloxy group having 2 to 10 carbon atoms, an acylamino group having 2 to 10 carbon atoms, an alkoxycarbonylamino group having 2 to 12 carbon atoms, an aryloxycarbonyl-amino group having 7 to 12 carbon atoms, a sulfonylamino group having 1 to 12 carbon atoms, a sulfamoyl group having 0 to 12 carbon atoms, a carbamoyl group having 1 to 12 carbon atoms, an alkylthio group having 1 to 12 carbon atoms, an arylthio group having 6 to 20 carbon atoms, a sulphonyl group having 1 to 12 carbon atoms, a sulfinyl group having 1 to 12 carbon atoms, an ureide group having 1 to 12 carbon atoms, a phosphoric amide group having 1 to 12 carbon atoms, a hydroxy group, a mercapto group, a halogen atom, a cyano group, a sulfo group, a carboxyl group, a nitro group, a hydroxamic acid group, a surufino group, a hydrazino group, an imino group, and a heterocycle group having 1 to 12 carbon atoms; and

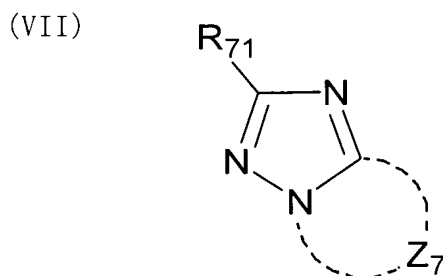
said substituent is unsubstituted or further substituted with an alkyl group, an alkenyl group, an aralkyl group, an aryl group, an acyl group, an alkoxyl group, an aryloxy group, an acyloxy group, an alkoxycarbonyl group, an aryloxycarbonyl group, a carbonylamino group, a sulfonyl amino group, a sulfamoyl group, a carbamoyl group, a cyano group, a halogen atom, a hydroxy group or a heterocyclic group.

Claim 8 (Currently Amended): An organic thin film transistor comprising:

at least three terminals consisting of a gate electrode, a source electrode and a drain electrode; and

an insulating layer and an organic semiconductor layer on a substrate, which controls an electric current flowing between the source electrode and the drain electrode by applying an electric voltage across the gate electrode, a distance between the source electrode and the drain electrode being 1 μ m to 1mm;

wherein the organic semiconductor layer comprises a ~~The organic thin film transistor according to Claim 1, wherein said heterocyclic compound containing a nitrogen atom is a compound expressed by a following general formula (VII):~~



wherein R₇₁ represents a hydrogen atom or a substituent; and

Z₇ represents a group forming a five-member ring or a six-member ring;

wherein the substituent represented by R₇₁ is selected from the group consisting of an alkyl group having 1 to 40 carbon atoms, an alkenyl group having 2 to 8 carbon atoms, an alkynyl group having 2 to 8 carbon atoms, an aryl group having 6 to 40 carbon atoms, an amino group having 0 to 6 carbon atoms, an alkoxyl group having 1 to 8 carbon atoms, an aryloxy group having 6 to 12 carbon atoms, an acyl group having 1 to 12 carbon atoms, an alkoxycarbonyl group having 2 to 12 carbon atoms, an aryloxycarbonyl group having 7 to 10 carbon atoms, an acyloxy group having 2 to 10 carbon atoms, an acylamino group having 2 to 10 carbon atoms, an alkoxycarbonylamino group having 2 to 12 carbon atoms, an aryloxycarbonyl-amino group having 7 to 12 carbon atoms, a sulfonylamino group having 1 to 12 carbon atoms, a sulfamoyl group having 0 to 12 carbon atoms, a carbamoyl group having 1 to 12 carbon atoms, an alkylthio group having 1 to 12 carbon atoms, an arylthio group having 6 to 20 carbon atoms, a sulphonyl group having 1 to 12 carbon atoms, a sulfinyl group having 1 to 12 carbon atoms, an ureide group having 1 to 12 carbon atoms, a

phosphoric amide group having 1 to 12 carbon atoms, a hydroxy group, a mercapto group, a halogen atom, a cyano group, a sulfo group, a carboxyl group, a nitro group, a hydroxamic acid group, a surufino group, a hydrazino group, an imino group, and a heterocycle group having 1 to 12 carbon atoms; and

said substituent is unsubstituted or further substituted with an alkyl group, an alkenyl group, an aralkyl group, an aryl group, an acyl group, an alkoxyl group, an aryloxy group, an acyloxy group, an alkoxycarbonyl group, an aryloxycarbonyl group, a carbonylamino group, a sulfonyl amino group, a sulfamoyl group, a carbamoyl group, a cyano group, a halogen atom, a hydroxy group or a heterocyclic group.

Claim 9 (Currently Amended): The organic thin film transistor according to ~~Claim 1~~ claim 3, wherein the distance between the source electrode and the drain electrode is 5 μm to 1mm.

Claim 10 (Currently Amended): The organic thin film transistor according to ~~Claim 1~~ claim 3, wherein the source electrode and the drain electrode are formed on the insulating layer.

Claim 11 (Currently Amended): The organic thin film transistor according to ~~Claim 1~~ claim 3, wherein the source electrode and the drain electrode are formed on the organic semiconductor layer.

Claim 12 (Currently Amended): The organic thin film transistor according to ~~Claim 1~~ claim 3, wherein the source electrode and the drain electrode are formed on the substrate.

Claim 13 (Canceled).

Claim 14 (Currently Amended): The organic thin film transistor according to ~~Claim 1~~ claim 3, wherein the source electrode and the drain electrode are juxtaposed on the substrate.

Claim 15 (Currently Amended): The organic thin film transistor according to ~~Claim 1~~ claim 3, wherein the source electrode and the drain electrode are formed in contact with a same plane.

Claim 16 (Currently Amended): The organic thin film transistor according to ~~Claim 1~~ claim 3, comprising a device structure selected from the group consisting of:

(A) the gate electrode, the insulating layer, a pair of the source electrode and the drain electrode and the organic semiconductor layer formed on the substrate in said order;

(B) the gate electrode, the insulating layer, the organic semiconductor layer and a pair of the source electrode and the drain electrode formed on the substrate in said order;

(C) a pair of the source electrode and the drain electrode, the organic semiconductor layer, the insulating layer and the gate electrode formed on the substrate in said order; and

(D) the organic semiconductor layer, a pair of the source electrode and the drain electrode, the insulating layer and the gate electrode formed on the substrate in said order.

Claim 17 (Currently Amended): The organic thin film transistor according to ~~Claim 1~~ claim 3, wherein the source electrode and the drain electrode are in contact with the organic semiconductor layer.

Claim 18 (New): The organic thin film transistor according to claim 4, wherein the distance between the source electrode and the drain electrode is 5 μm to 1mm.

Claim 19 (New): The organic thin film transistor according to claim 4, wherein the source electrode and the drain electrode are formed on the insulating layer.

Claim 20 (New): The organic thin film transistor according to claim 4, wherein the source electrode and the drain electrode are formed on the organic semiconductor layer.

Claim 21 (New): The organic thin film transistor according to claim 4, wherein the source electrode and the drain electrode are formed on the substrate.

Claim 22 (New): The organic thin film transistor according to claim 4, wherein the source electrode and the drain electrode are juxtaposed on the substrate.

Claim 23 (New): The organic thin film transistor according to claim 4, wherein the source electrode and the drain electrode are formed in contact with a same plane.

Claim 24 (New): The organic thin film transistor according to claim 4, comprising a device structure selected from the group consisting of:

(A) the gate electrode, the insulating layer, a pair of the source electrode and the drain electrode and the organic semiconductor layer formed on the substrate in said order;

(B) the gate electrode, the insulating layer, the organic semiconductor layer and a pair of the source electrode and the drain electrode formed on the substrate in said order;

(C) a pair of the source electrode and the drain electrode, the organic semiconductor layer, the insulating layer and the gate electrode formed on the substrate in said order; and

(D) the organic semiconductor layer, a pair of the source electrode and the drain electrode, the insulating layer and the gate electrode formed on the substrate in said order.

Claim 25 (New): The organic thin film transistor according to claim 4, wherein the source electrode and the drain electrode are in contact with the organic semiconductor layer.

Claim 26 (New): The organic thin film transistor according to claim 6, wherein the distance between the source electrode and the drain electrode is 5 μm to 1 mm.

Claim 27 (New): The organic thin film transistor according to claim 6, wherein the source electrode and the drain electrode are formed on the insulating layer.

Claim 28 (New): The organic thin film transistor according to claim 6, wherein the source electrode and the drain electrode are formed on the organic semiconductor layer.

Claim 29 (New): The organic thin film transistor according to claim 6, wherein the source electrode and the drain electrode are formed on the substrate.

Claim 30 (New): The organic thin film transistor according to claim 6, wherein the source electrode and the drain electrode are juxtaposed on the substrate.

Claim 31 (New): The organic thin film transistor according to claim 6, wherein the source electrode and the drain electrode are formed in contact with a same plane.

Claim 32 (New): The organic thin film transistor according to claim 6, comprising a device structure selected from the group consisting of:

(A) the gate electrode, the insulating layer, a pair of the source electrode and the drain electrode and the organic semiconductor layer formed on the substrate in said order;

(B) the gate electrode, the insulating layer, the organic semiconductor layer and a pair of the source electrode and the drain electrode formed on the substrate in said order;

(C) a pair of the source electrode and the drain electrode, the organic semiconductor layer, the insulating layer and the gate electrode formed on the substrate in said order; and

(D) the organic semiconductor layer, a pair of the source electrode and the drain electrode, the insulating layer and the gate electrode formed on the substrate in said order.

Claim 33 (New): The organic thin film transistor according to claim 6, wherein the source electrode and the drain electrode are in contact with the organic semiconductor layer.

Claim 34 (New): The organic thin film transistor according to claim 7, wherein the distance between the source electrode and the drain electrode is 5 μm to 1 mm.

Claim 35 (New): The organic thin film transistor according to claim 7, wherein the source electrode and the drain electrode are formed on the insulating layer.

Claim 36 (New): The organic thin film transistor according to claim 7, wherein the source electrode and the drain electrode are formed on the organic semiconductor layer.

Claim 37 (New): The organic thin film transistor according to claim 7, wherein the source electrode and the drain electrode are formed on the substrate.

Claim 38 (New): The organic thin film transistor according to claim 7, wherein the source electrode and the drain electrode are juxtaposed on the substrate.

Claim 39 (New): The organic thin film transistor according to claim 7, wherein the source electrode and the drain electrode are formed in contact with a same plane.

Claim 40 (New): The organic thin film transistor according to claim 7, comprising a device structure selected from the group consisting of:

(A) the gate electrode, the insulating layer, a pair of the source electrode and the drain electrode and the organic semiconductor layer formed on the substrate in said order;

(B) the gate electrode, the insulating layer, the organic semiconductor layer and a pair of the source electrode and the drain electrode formed on the substrate in said order;

(C) a pair of the source electrode and the drain electrode, the organic semiconductor layer, the insulating layer and the gate electrode formed on the substrate in said order; and

(D) the organic semiconductor layer, a pair of the source electrode and the drain electrode, the insulating layer and the gate electrode formed on the substrate in said order.

Claim 41 (New): The organic thin film transistor according to claim 7, wherein the source electrode and the drain electrode are in contact with the organic semiconductor layer.

Claim 42 (New): The organic thin film transistor according to claim 8, wherein the distance between the source electrode and the drain electrode is 5 μm to 1 mm.

Claim 43 (New): The organic thin film transistor according to claim 8, wherein the source electrode and the drain electrode are formed on the insulating layer.

Claim 44 (New): The organic thin film transistor according to claim 8, wherein the source electrode and the drain electrode are formed on the organic semiconductor layer.

Claim 45 (New): The organic thin film transistor according to claim 8, wherein the source electrode and the drain electrode are formed on the substrate.

Claim 46 (New): The organic thin film transistor according to claim 8, wherein the source electrode and the drain electrode are juxtaposed on the substrate.

Claim 47 (New): The organic thin film transistor according to claim 8, wherein the source electrode and the drain electrode are formed in contact with a same plane.

Claim 48 (New): The organic thin film transistor according to claim 8, comprising a device structure selected from the group consisting of:

(A) the gate electrode, the insulating layer, a pair of the source electrode and the drain electrode and the organic semiconductor layer formed on the substrate in said order;

(B) the gate electrode, the insulating layer, the organic semiconductor layer and a pair of the source electrode and the drain electrode formed on the substrate in said order;

(C) a pair of the source electrode and the drain electrode, the organic semiconductor layer, the insulating layer and the gate electrode formed on the substrate in said order; and

(D) the organic semiconductor layer, a pair of the source electrode and the drain electrode, the insulating layer and the gate electrode formed on the substrate in said order.

Claim 49 (New): The organic thin film transistor according to claim 8, wherein the source electrode and the drain electrode are in contact with the organic semiconductor layer.